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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/735,592	12/12/2000	Michael Wayne Brown	AUS9-2000-0720-US1	8578
35525	7590	07/14/2004	EXAMINER	
IBM CORP (YA) C/O YEE & ASSOCIATES PC P.O. BOX 802333 DALLAS, TX 75380			ALI, SYED J	
			ART UNIT	PAPER NUMBER
			2127	

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/735,592	BROWN ET AL.	
	Examiner	Art Unit	
	Syed J Ali	2127	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>April 20, 2001</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-22 are pending in this application.

Information Disclosure Statement

2. Documents AB and AD, as listed by Applicant in the IDS submitted on April 20, 2001, do not correspond to PTO records. Neither the publication dates nor the inventor names are in agreement. Document AB (USPN 5,826,763 to Roberts) and document AD (USPN 5,430,580 to Bigelow et al.) are unrelated to the technical field of the present invention and do not appear to have any relevance to the subject matter contained in the present application. Thus, they have not been considered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1-5, 9-14, 16, and 19-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Hall et al. (USPN 5,974,541) (hereinafter Hall).**

5. As per claim 1, Hall teaches the invention as claimed, including a method for asynchronous execution within a program, comprising:

executing code in a first thread (col. 4 lines 1-14; col. 12 lines 24-31);

determining whether a first keyword exists in the code, the first keyword indicating a code element that may be executed out of order (col. 4 line 57 - col. 5 line 8; col. 6 lines 17-33; col. 7 lines 26-30); and

executing the code element in a second thread (col. 8 lines 45-52; col. 13 lines 59-67).

6. As per claim 2, Hall teaches the invention as claimed, including the method of claim 1, wherein the code element is one of an instruction, block, and a method (col. 7 lines 26-30).

7. As per claim 3, Hall teaches the invention as claimed, including the method of claim 1, wherein the first keyword exists in a definition of a method (col. 7 lines 26-30).

8. As per claim 4, Hall teaches the invention as claimed, including the method claim 1, wherein the first thread is executed on a first processor and the second thread is executed on a second processor (col. 1 lines 25-32).

9. As per claim 5, Hall teaches the invention as claimed, including the method of claim 1, further comprising:

determining whether a second keyword exists in the code, the second keyword indicating that execution of the code element in the second thread must complete before the next code element is executed (col. 12 line 50 - col. 13 line 20); and

executing the next code element in the first thread after execution of the code element in the second thread completes (col. 12 line 50 - col. 13 line 20).

10. As per claim 9, Hall teaches the invention as claimed, including the method of claim 1, wherein the second thread is a light weight thread (col. 4 lines 1-14; col. 8 lines 45-52; col. 13 lines 59-67).

11. As per claim 10, Hall teaches the invention as claimed, including an apparatus for asynchronous execution within a program, comprising:

first execution means for executing code in a first thread (col. 4 lines 1-14; col. 12 lines 24-31);

determination means for determining whether a first keyword exists in the code, the first keyword indicating a code element that may be executed out of order (col. 4 line 57 - col. 5 line 8; col. 6 lines 17-33; col. 7 lines 26-30); and

second execution means for executing the code element in a second thread (col. 8 lines 45-52; col. 13 lines 59-67).

12. As per claim 11, Hall teaches the invention as claimed, including the apparatus claim 10, wherein the code element is one of an instruction, a block, and a method (col. 7 lines 26-30).

13. As per claim 12, Hall teaches the invention as claimed, including the apparatus claim 10, wherein the first keyword exists in a definition of a method (col. 7 lines 26-30).

14. As per claim 13, Hall teaches the invention as claimed, including the apparatus of claim 10, wherein the first thread is executed on a first processor and the second thread is executed on a second processor (col. 1 lines 25-32).

15. As per claim 14, Hall teaches the invention as claimed, including the apparatus of claim 10 further comprising:

means for determining whether a second keyword exists in the code, the second keyword indicating that execution of the code element in the second thread must complete before the next code element is executed (col. 12 line 50 - col. 13 line 20); and

means for executing the next code element in the first thread after execution of the code element in the second thread completes (col. 12 line 50 - col. 13 line 20).

16. As per claim 16, Hall teaches the invention as claimed, including the apparatus of claim 10, wherein the second thread is a light weight thread (col. 4 lines 1-14; col. 8 lines 45-52; col. 13 lines 59-67).

17. As per claim 19, Hall teaches the invention as claimed, including a computer program product, a computer readable medium for asynchronous execution within a program, comprising:

instructions for executing code first thread (col. 4 lines 1-14; col. 12 lines 24-31);

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instructions for determining whether a first keyword exists in the code, the first keyword indicating a code element that may be executed out of order (col. 4 line 57 - col. 5 line 8; col. 6 lines 17-33; col. 7 lines 26-30); and

instructions for executing the code element in a second thread (col. 8 lines 45-52; col. 13 lines 59-67).

18. As per claim 20, Hall teaches the invention as claimed, including the computer program product of claim 19, wherein the first thread is executed on a first processor and the second thread executed on a second processor (col.1 lines 25-32).

19. As per claim 21, Hall teaches the invention as claimed, including the computer program product of claim 19, further comprising:

instructions for determining whether a second keyword exists in the code, the second keyword indicating that execution of the code element in the second thread must complete before the next code element is executed (col. 12 line 50 - col. 13 line 20); and

instructions for executing the next code element in the first thread after execution of the code element in the second thread completes (col. 12 line 50 - col. 13 line 20).

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. **Claims 6, 15, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall in view of Blewett (USPN 5,551,040).**

22. As per claim 6, Blewett teaches the invention as claimed, including the method of claim 1, further comprising:

determining whether a third keyword exists in the code element, the third keyword indicating a statement that may be executed out of order (col. 5 lines 10-26); and

executing the statement in a third thread (col. 5 lines 10-26).

23. It would have been obvious to one of ordinary skill in the art to combine Hall and Blewett since the asynchronous processing method of Hall is severely limited in that only one asynchronous call may be outstanding at one time (col. 8 lines 1-5). If the asynchronous code block contains another asynchronous call, the call must either be cancelled or the call must wait until the outstanding call is returned. Blewett specifically addresses this problem by providing a framework to allow nesting of asynchronous callbacks, such that "execution of the callback function for the new signal...may be commenced in exactly the same fashion that invocation of one function by another suspends execution of the invoking function until execution of the invoked function is finished." (col. 5 lines 10-26)

24. As per claim 15, Blewett teaches the invention as claimed, including the apparatus of claim 10 further comprising:

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means for determining whether a third keyword exists in the code element, the third keyword indicating a statement that may be executed out order (col. 5 lines 10-26);

and

means for executing the statement in a third thread (col. 5 lines 10-26).

25. As per claim 22, Blewett teaches the invention as claimed, including the computer program product of claim 19, further comprising:

instructions for determining whether a third keyword exists in the code element, the third keyword indicating a statement that may be executed out of order (col. 5 lines 10-26); and

instructions for executing the statement in a third thread (col. 5 lines 10-26).

26. **Claims 7-8 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall in view of Hogle et al. (USPN 6,560,626) (hereinafter Hogle).**

27. As per claim 7, Hogle teaches the invention as claimed, including the method of claim 1, wherein the method is executed by an interpreter (col. 9 lines 35-55).

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28. It would have been obvious to one of ordinary skill in the art to combine Hall and Hogle since the functionality of the asynchronous callback method in Hall is limited to C or Visual Basic code. Hogle teaches a framework that allows asynchronous callbacks within a Java virtual machine, which would be especially desirable considering the prevalence of Java coding in modern computing environments. The asynchronous callback method of Hall is demonstrated in C code, which is easily converted to Java code. To do so would allow the code more portability, since the code does not have to be compiled before it is run, as Java code is hardware independent. Thus, the method would be much better suited for diverse computing environments.

29. As per claim 8, Hogle teaches the invention as claimed, including the method of claim 7, wherein the interpreter is a Java virtual machine (col. 9 lines 35-55).

30. As per claim 17, Hall teaches the invention as claimed, including an apparatus for asynchronous execution within a program, comprising:

a program, the program including a first keyword indicating a code element that may be executed out of order (col. 4 line 57 - col. 5 line 8; col. 6 lines 17-33; col. 7 lines 26-30), wherein upon detecting the keyword, a light weight thread is created (col. 4 lines 1-14; col. 8 lines 45-52; col. 13 lines 59-67) and executes the code element in the light weight thread (col. 8 lines 45-52; col. 13 lines 59-67).

31. Hogle teaches the invention as claimed, including the following limitations not shown by Hall:

an interpreter (col. 9 lines 35-55).

32. As per claim 18, Hogle teaches the invention as claimed, including the apparatus claim 17, wherein the interpreter is a Java virtual machine (col. 9 lines 35-55).

Conclusion

33. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Dorn et al. (USPN 6,012,081) teaches executing asynchronous callbacks in parallel threaded environments.

Alverson et al. (USPN 6,314,471) teaches an asynchronous callback method that places asynchronous requests on a queue for servicing.

Marty (US 2004/0031018) teaches a method executing a code block in parallel in response to the use of the keyword “async”, which triggers creation of a new thread of execution, wherein control is immediately handed over with execution continuing in the created thread.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J Ali whose telephone number is (703) 305-8106. The examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai T An can be reached on (703) 305-9678. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Syed Ali
July 2, 2004

